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Summary

Contents

Contents

Does IT Matter?
New Editing and Imputation Methodologies for BAS Data
Making Quality Visible
Synthesising Estimates of Indigenous Child Health
Imputing Rent for Owner Occupied Dwellings in Household Income Statistics
How to Contact Us and Subscriber E-mailing List

Does IT Matter?

Does IT Matter?

This is the question a recently completed Analytical Service Branch (ASB) study pursued. In particular, the study examined the relationship between business use of IT and innovation using firm-level records linked from the 2003 Innovation Survey and the 2002-03 Business Use of Information Technology (BUIT) Survey. The study investigated the association between different types of innovation and IT use by businesses, using a multivariate regression approach.

Previous studies on the determinants of innovation made use of a broad dichotomy of innovation, that is, a firm either innovated or not. This study progressed from that by modelling different types of innovations and combinations of innovation activities. By definition, innovation can occur in three areas: goods and services, operational processes, and organisational/managerial operations.

The study postulated that IT variables such as computer use, Internet access, website presence, e-business (such as receiving orders via the Internet) and broadband connection have varying associations with different types, combinations or intensities of innovative activities.

Results suggest some evidence of a positive association between a host of IT variables and a range of innovation indicators. It is found that apart from IT variables, other firm-level and industry-specific variables influence the propensities of firms to innovate in one type or another. The variables that stand out from amongst the models are IT human resource and collaboration variables. These factors, including the spatial and institutional aspects of collaboration, have been shown to influence the odds of innovating.

The study is undertaken as a collaborative research between the ASB and the Integration, Coordination and Innovation Branch in Economic Statistics Group (ESG).

For more information, please contact Ruel Abello on (02) 6252 6307.

New Editing and Imputation Methodologies for BAS Data

New Editing and Imputation Methodologies for BAS Data

Quality of auxiliary variables (benchmarks) on the business frame will be improved. The Victorian Methodology Unit have recently undertaken a project to improve the methodologies for editing Business Activity Statement (BAS) data and for calculating turnover and wages and salaries benchmarks for units in the quarterly common frames that are in scope of business collections. Work is currently being undertaken to implement these new methodologies. Plan is

to introduce the new BAS benchmarks starting with the March 07 Common Frame (CF). Both the new and current benchmarks will thus be available for units on the March 07 CF.
The current benchmarks will continue to be made available until the Monthly Retail Business Survey will move to using the new benchmarks both for stratification and estimation.

Editing Goods and Services Tax (GST) items (e.g. BAS sales) has undergone significant changes. The new editing methodology makes more use of information available on the BAS return to detect anomalies compared to the old methodology (for example, verifying relationships between data items). The option used to report GST items is also used. Data reported is checked to ensure that it is consistent with the option used by the business. Moreover, the old methodology doesn't distinguish between zero and missing values while the new methodology writes a zero for blank returns that have a finalised status. Quality measures from the editing process were also improved.

Due to limited information on the BAS return that can be used to edit Income Tax Withholding (ITW) items (e.g. wages and salaries), the new editing methodology for these items continues to rely heavily on tolerance checks as the current methodology does. The methodology used to set tolerances, however, was improved.

The main changes introduced in the calculation of Australian Business Number (ABN) level benchmarks include:

- nilling of turnover benchmarks for ABNs with cancelled or no GST role or were GST long-term non-remitters
- use of historical data for imputation
- use of median instead of mean of an imputation class for imputing fully non-reporting ABNs
- accepting zeros as valid and not replacing these with a non-nil impute (except for newly birthed units)
- turnover reported by the lead ABN of a GST group is now prorated to members using modelled income, replacing derived size benchmark (DSB) for proration.

Methodology for calculating Type of Activity Unit (TAU) benchmarks have changed significantly. The current methodology models TAU benchmarks using DSB. The new methodology uses ABN level benchmarks of ABS maintained population (ABSMP) ABNs as source of data for TAU benchmarks. A simple aggregation is done in cases where ABN(s) forming the TAU can be identified. For the majority of the remaining TAUs, ABN level benchmarks that are aggregated at enterprise (EN) level are prorated to TAUs formed from the EN. In a small number of complex units, proration is done at enterprise group (EG) level and is prorated to TAUs belonging to the EG.

For further information please contact Elsa Lapiz on (03) 9615 7364.

Back to top

Making Quality Visible

Making Quality Visible

Making Quality Visible (MQV) has been a key focus of the ABS since the late 1990s. The main tenet of MQV is that the users of ABS statistics benefit from understanding the quality of those statistics. This allows 'informed use' of the statistics and for the user to judge whether they are suitable for the purpose to which they are being put.

The changing environment, in particular the increased importance of the ABS web site as the main dissemination source of ABS statistics, has introduced new challenges and opportunities to how the ABS can better ensure that end users have relevant and accessible quality information to guide their use of the statistics.
We also hope that ABS work in describing quality effectively in an electronic environment will serve as an example or an inspiration to other agencies and organisations. A key National Data Network (NDN) endorsed principle is that "the quality of the data should be described clearly and understandably". Quality declarations are a method by which this can be done.

Quality Declarations
Quality Declarations (QDs) are statements on the quality of statistical outputs that have been written specifically for web-based dissemination. They describe the quality of a statistical release using the six dimensions of the ABS data quality framework - relevance, accuracy, timeliness, accessibility, interpretability and coherence. This information is 'layered' so that casual users get a brief 'headline' indication of quality while users who are interested in more detail can easily access it.

The ABS data quality framework closely aligns with international work on data quality. For more information on this framework, please refer to the Statistics Canada publication catalogue number 12-586-X, Statistics Canada's Quality Assurance Framework, which can be downloaded from the Statistics Canada web site at http://www.statcan.ca.

Electronic publication and metadata vision

Quality Declarations are also an important component of the ABS' Vision for Electronic Publication and Metadata. The Vision aims to improve the way the ABS communicates data and metadata electronically to facilitate user discovery of information, assessment of fitness for purpose and understanding of the key stories within the data. The main strategies for achieving the Vision include: using a layered approach for the presentation of information; developing basic guidelines for writing for the web; using the concept of web magazines to ensure that statistical stories are clearly visible; and contextual linking of metadata to statistical products such as publications, time series spreadsheets and data cubes. A prototype for this has been built and is available at https://www.abs.gov.au/about/ePublication.

Training available
The course Making Quality Informed Decisions is offered by the National Statistical Training Institute (NSTI) to help people effectively use the data quality framework to systematically understand quality issues associated with using data sources. More information can be found on the ABS web site https://www.abs.gov.au under Services We Provide / ABS Training / Statistical Training.

For further information on this work, please contact Bruce Fraser on (02) 6252 7306 or Narrisa Gilbert on (02) 6252 5283.

Back to top

Synthesising Estimates of Indigenous Child Health

Synthesising Estimates of Indigenous Child Health

The Indigenous population in Australia have health outcomes far below those of the rest of the population. Many of the health conditions suffered by Indigenous people can be linked to factors which appear at a very early age. The Western Australian Aboriginal Child Health Survey (WAACHS), conducted by the Telethon Institute for Child Health Research (TICHR) in Western Australia (WA), was the first large scale epidemiological survey of Indigenous children and young people in Australia.

Analytical Services Branch, in collaboration with TICHR, investigated the feasibility of synthesising estimates of Indigenous child health and well-being for regions in Queensland (QLD) and the Northern Territory (NT) based on the WAACHS conducted in WA. The study was supported with funding provided by the Rio Tinto Aboriginal Child Health partnership, a collaboration between NT, QLD, WA and Australian governments, TICHR and Rio Tinto.

The broad approach to this task was as follows:

- for each variable of interest from the WAACHS, develop a model which describes its relationship to variables such as age, sex, socio-economic status and area type,
- apply these models to relevant census data from NT and QLD to predict a set of indicator variables for each ATSIC region within these jurisdictions.
- The key assumptions behind this modelling exercise are that:
- the predictor variables drawn from the WAACHS are available for NT and QLD in a comparable form through the ABS Census of Population and Housing (they measure the same concept and were collected using similar questions),
- models with reasonable explanatory power can be developed from the WAACHS, for WA ATSIC regions,
- relationships identified in the WAACHS data for Western Australia will be similar to those in Queensland and the Northern Territory.

The validity and quality of all synthetic estimates depends critically on the key assumptions. Estimates derived from the models need to be used in the context of their assumptions and the quality statements included with them.

Attention focussed on three test variables: low birth weight, tropical ear, and self harm. The results of the feasibility study showed that:

- predictor variables drawn from the WAACHS were available on the ABS Census of Population and Housing in a comparable form,
- a reasonable model for low birth weight could not be developed, as key factors such as gestation period, mother's age and health status were not available,
- for the other variables there was inconclusive evidence that the relationships identified by the WA models would hold across other jurisdictions.

As there was sufficient doubt as to the validity of the fitted models and the ability to map these to other jurisdictions, we concluded that it was not feasible to construct synthetic estimates for NT and QLD.

Despite the estimation proving unfeasible, this collaborative work served an important case study into extrapolation

using synthetic estimation techniques. One related research paper has been released from the study (ABS catalogue number 1352.0.55.071) and another is forthcoming.

For more information please contact Jonathon Khoo on (02) 6252 5506.

Back to top

Imputing Rent for Owner Occupied Dwellings in Household Income Statistics

Imputing Rent for Owner Occupied Dwellings in Household Income Statistics

Imputed rent for owner occupied dwellings (OODs) is a significant component of the international standards for household income and expenditure statistics. The ABS has not previously released household level estimates for the imputed rent of OODs in its household income and expenditure statistics, although household sector estimates have been included in the Australian National Accounts for many years.

Conceptually, the inclusion of imputed rent treats owner occupiers as if they rent their home to themselves, thus simultaneously incurring rental income and expenditure. Analysts using this data in income distribution studies can gain additional insights into the economic wellbeing of the population. Its inclusion allows more direct comparison of income across different housing tenures and over different life cycle stages.

Analytical Services Branch have been working with Living Conditions Section on a project to impute rent for OODs in ABS household income statistics, using data from the Household Income and Expenditure Survey (HIES) 2003-04 and the Survey of Income and Housing (SIH) 2005-06.

As owners don't actually pay rent, the key issue is what data is available to enable imputation of a rental value for each OOD and what methodology should be applied to estimate it. HIES and SIH collect data on the rent paid by renters and the housing costs incurred by owner occupiers i.e repairs and maintenance, rates, body corporate fees, insurance and mortgage interest payments.

We have used the 'market value' approach recommended in the international standards for household income and expenditure statistics, International Conference of Labour Statisticians, 2003. It calculates a net imputed rent income by estimating an equivalent market rent and subtracting the expenses incurred in earning that income i.e any expenses that would be paid by a landlord in the case of a rented dwelling.

Weekly rent paid by renters is modelled against a range of household and location characteristics, including number of bedrooms, type of dwelling, income and area characteristics measured by state, SEIFA and median rent postcode deciles. To account for selection bias caused by fitting a model to renters, and applying it to owners, we have used the Heckman model recommended by the European Statistical Agency (Eurostat). The model is then fitted to OODs, predicting their market rents, given their particular household and location characteristics.

The project is currently producing provisional estimates and comparing the results obtained with the sectoral aggregates released in the national accounts. It will also be undertaking analyses of the impact of the inclusion of the OOD rent estimates on income distributions generally, and for specific population sub-groups, in order to assess their suitability for release.

For more information please contact Jonathon Khoo on (02) 6252 5506.

Back to top

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The Methodological Newsletter features articles and developments in relation to work done within the ABS Methodology Division. By it’s nature the work of the Division brings it into contact with virtually every other area of the ABS. Because of this the newsletter is a way of letting all areas of the ABS know of some of the issues we are working on and help information flow. We hope the Methodological Newsletter is useful and welcome comments.

If you would like to be placed on our electronic mailing list, please contact:

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About this Release

Methodological News

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